

Amendments to the Specification are as follows:

Please amend the paragraph on page 6, lines 17-28 as follows:

(Amended) As one of solutions to overcome the above-described insulation problem, the thickness of the second antiferromagnetic layer 7 may be reduced. However, a reduced thickness of the second antiferromagnetic layer 7 leads to a reduced intensity of the exchange coupling magnetic field generated between the second antiferromagnetic layer and each end portion 6a of the free magnetic layer 6. As a result, since the magnetization of the end portions 6a of the free magnetic layer 6 is not surely fixed, ~~it has been concerned that reproduction characteristics are~~ negatively affected, so that off-track characteristics are degraded and linearity ~~does~~ is not sufficiently maintained.

Please amend the paragraph on page 10, lines 18-26 as follows:

(Amended) The magnetic detecting element may further include a backed layer on the upper surface of the second free magnetic layer in at least the region opposing the multilayer laminate in the thickness direction. Preferably, the backed layer is formed of an element selected from the group consisting of Cu, Au, Cr, and Ru. By providing the backed layer, a large rate of change in resistance can be obtained in the magnetic element by a so-called spin filter effect. Thus, the magnetic detecting element is adapted to high density recording.

Please amend the paragraph on page 23, lines 18-25 as follows:

(Amended) The nonmagnetic material layer 25 prevents the magnetic coupling of the pinned magnetic layer 24 with the first free magnetic layer 26 and through which sense current mainly flows. Preferably, the nonmagnetic material layer 25 is formed of a conductive nonmagnetic material, such as Cu, Cr, Au, or Ag. Cu is particularly preferable. The nonmagnetic material layer 25 is formed to a thickness, for example in the range of about 18 to 30 Å.

Please amend the paragraph beginning on page 31, line 17 and ending on page 32, line 7 as follows:

(Amended) As described above, when the thickness of the nonmagnetic layers is in the range of 6 to 11 Å, RKKY interaction occurs between the ferromagnetic layers opposing each other with the nonmagnetic layer therebetween, and, thus, the magnetizations of the ferromagnetic layers are antiparallel to each other. On the other

hand, when the thickness of the nonmagnetic layer is reduced to less than 6 Å, the ferromagnetic layers are magnetized in the same direction. For example, when the thickness of the nonmagnetic layer 37 on the ferromagnetic layer 36 is 6 to 11 Å and the thickness of the nonmagnetic layer 27 on the first free magnetic layer 26 is 6 Å or less, the magnetizations of the ferromagnetic layer 36 and the second free magnetic layer 38 are antiparallel to each other due to an exchange coupling provided by RKKY interaction between the ferromagnetic layer 36 and the free magnetic layer 38 in the end portions C. On the other hand, the second free magnetic layer 38 and the first free magnetic layer 26 in the central portion D are magnetized in the same direction.

Please amend the paragraph on page 33, lines 14-21 as follows:

(Amended) The cap layer 39 may be a backed layer. The backed layer is formed of, for example, Cu, Au, Cr, or Ru. By providing the backed layer, the mean free path of up-spin conduction electrons contributing to the magnetoresistance effect is extended, and, thus, a large rate of change in resistance can be obtained in a magnetic element by a so-called sin α spin filter effect. Thus, the magnetic element is adapted to high density recording.

Please amend the paragraph on page 40, lines 7-15 as follows:

(Amended) In the third embodiment shown in Fig. 3, since a bias magnetic field is applied from above and below the second free magnetic layer 38, the magnetization of the second free magnetic layer 38 is surely fixed in the end portions C, and particularly in the vicinity of the central portion D. Thus, the magnetic detecting element can exhibit more excellent reproduction characteristics, and in which, for example, the off-~~track~~track characteristics can further be enhanced and a satisfactory linearity can be ensured.

Please amend the paragraph beginning on page 43, line 12 and ending on page 44, line 9 as follows:

(Amended) In the fourth embodiment shown in Fig. 4, the thickness of the third antiferromagnetic layer 49, which is disposed above the second free magnetic layer 38 in each end portion C with the fourth antiferromagnetic layer 50 therebetween, is reduced effectively in comparison with the known element. This is because since the third antiferromagnetic layer 49 has the fourth antiferromagnetic layer 50 thereunder to form an integrated antiferromagnetic layer with the ~~forth~~fourth antiferromagnetic layer 50, an suitable exchange coupling magnetic field can be generated between the fourth

antiferromagnetic layer 50 and the second free magnetic layer 38 in the end portions C even if the thickness of the third antiferromagnetic layer 49 is small. Also, since the third antiferromagnetic layer 49 is an adjunctive layer for supporting the bias magnetic field from the second antiferromagnetic layer 35, which is disposed under the second free magnetic layer 38 in the end portions C, it can be serve as an adjunctive bias layer if a certain degree of exchange coupling magnetic field is generated from the fourth antiferromagnetic layer 50 in the end portions C, which overlapped with the third antiferromagnetic layer 49. This is also the reason why the thickness of the third antiferromagnetic layer 49 can be reduced. Preferably, the thickness of the third antiferromagnetic layer 49 is set such that the total thickness, including the fourth antiferromagnetic layer 50 is in the range of 50 to 200 Å.

Please amend the paragraph on page 51, lines 14-25 as follows:

(Amended) The lower shield layer 20 is formed of a magnetic material such as a NiFe alloy, and the lower gap layer 21 is formed of an insulating material such as Al_2O_3 or SiO_2 . The seed layer 22 is formed of a NiFe alloy, a NiFeCr alloy, Cr, or the like. The first antiferromagnetic layer 23 is formed of: an antiferromagnetic material containing element X and Mn; or a X-Mn-X' alloy, wherein X is at least one element selected from the group consisting of Pt, Pd, Ir, Rh, Ru, and Os, and X' is at least one element selected from the group consisting of Ne, Ar, Kr, Xe, Be, B, C, N, Mg, Al, Si, P, Ti, V, Cr, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ag, Cd, Ir, Sn, Hf, Ta, W, Re, Au, Pb, and ~~rare~~rare earth elements.

Please amend the paragraph beginning on page 51, line 26 and ending on page 52, line 4 as follows:

(Amended) The pinned magnetic layer 24 has a so-called artificial ferrimagnetic structure including three layers composed of magnetic layers 31 and 33 separated by a nonmagnetic interlayer 32. The magnetic layers 31 and 32 are formed of a magnetic material, such as a CoFe alloy, a CoFeNi alloy, Co, or a NiFe alloy, and the nonmagnetic interlayer ~~32~~33 is formed of a nonmagnetic material, such as Ru, Rh, Ir, Cr, Re, or Cu.

Please amend the paragraph on page 69, lines 21-28 as follows:

(Amended) Also, if the third antiferromagnetic layer 49 is formed on the second free magnetic layer 38 in the end portions C without the ~~forth~~fourth antiferromagnetic layer 50, an exchange coupling magnetic field having a suitable intensity is not

generated between the fourth antiferromagnetic layer 50 and the second free magnetic layer 38 in the end portions C. This is the reason for providing the fourth antiferromagnetic layer 50.